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Original Research Article

Tp-Te interval variation and its association with MACE as a metric of effective fibrinolysis in patients with STEMI from East India

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ABSTRACT

Introduction: Coronary artery disease (CAD) poses a significant health burden in India, and ST-elevation myocardial infarction (STEMI) is one of its most severe manifestations. The electrical activity is variable during STEMI, which produces dispersion and raises the T Peak-T End (Tp-Te) interval. STEMI is a medical emergency that requires prompt intervention to restore blood flow to the affected part of the heart muscle. Timely diagnosis and treatment are crucial in reducing morbidity and mortality associated with STEMI. Despite advancements in medical care, access to timely intervention and appropriate healthcare facilities remains a challenge in many parts of India, especially in rural areas.

Methods: This single-center, prospective observational study included 150 STEMI patients. Clinical, demographic, and ECG data were recorded. The Tp-Te interval alterations and their relationship to major adverse cardiovascular events (MACE) in STEMI patients both during and after successful or unsuccessful fibrinolysis were examined.

Results: Patients without MACE had a significant mean decrease in the Tp-Te interval following successful fibrinolysis (i.e., 18.47 ± 5.66 ms vs. 10 ± 7.07 ms, p:0.039) compared to patients with MACE. It was found that after fibrinolysis, patients with a Tp-Te interval > 100 ms experienced much higher rates of death (4% vs. 0%, p:0.0001), arrhythmias (7.3% vs. 0.7%, p:0.0001), and heart failure (16% vs. 1.3%, p:0.0001), both while they were in the hospital and within 30 days of the index event.

Conclusion: Our data shows that a decrease in the Tp-Te interval following fibrinolysis lowers the risk of MACE both during hospital stay and within 30 days following the index incident.

1. Introduction

As per World Health Organisation (WHO) statistics 2023, people from diverse backgrounds and geographical locations are impacted by NCDs (noncommunicable diseases). Devastating health effects for people, families, and communities are posed by the NCD epidemic. For the 21st century, prevention and control of these diseases are critical development imperatives. In 2019, the combined death toll from four main NCDs was approximately 33.3 million (UI: 24.5–43.3 million), a 28% rise from 2000. With 17.9 million cases (UI: 13.4–22.9 million), cardiovascular disease (CVD) was shown to be the most prevalent of these NCDs.[1,2] In India, coronary artery disease (CAD) is currently the most prevalent non-infectious illness.[3] According to projections, the mortality rate from CAD in India is expected to climb by 117% for men and 105% for women between 1990 and 2020. In Western nations, the frequency of CAD in young people is between 2 and 5%, nevertheless, among Asian Indians, it is between 11 and 16%.[4] The world's highest incidence of acute coronary syndrome (ACS) is found in India.[3] According to data from the CREATE Registry, patients with ACS in India have a higher percentage of ST-elevation myocardial infarction

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(STEMI) than patients in developed nations.[4] Hospitalized individuals are frequently diagnosed with STEMI, which is the most serious consequence of CAD.[3] It is estimated that there are over 3 million STEMI that happen in India annually. In India, the first attempt to create STEMI management procedures was made in 2011.[4] When it comes to STEMI, reperfusion therapy is crucial in reducing both the morbidity and fatality rates.[3]

American College of Cardiology has set the following ECG criteria for STEMI (in the absence of bundle branch block and left ventricular hypertrophy): 1. a new ST-elevation: ≥ 1 mm in all leads except leads V2–V3, at the J-point in two adjacent leads; 2. the cut points in V2 and V3 are as follows: ≥ 2 mm for men 40 years of age or older, ≥ 2.5 mm for men under 40, and ≥ 1.5 mm for women of any age.[5] Complete thrombotic blockage of the infarct-related artery causes STEMI, a life-threatening emergency that must be treated quickly. About thirty percent of patients with STEMI have a high risk of short-term death. The chance of death is more than 5% in the remaining 70% of instances.[2] During STEMI, there is an increase in the dispersion between normal non-ischemic and infarcted tissue, which serves as a substrate for different types of ventricular arrhythmias. The increase in Tp-Te interval reflects this dispersion.[6] Early detection and intervention have been shown to lower mortality, enhance prognosis, and shorten hospital stays for STEMI patients. To attain optimal patient outcomes, the most crucial aspect is the total ischemia time, which is the duration between the onset of symptoms and the start of reperfusion therapy. Reperfusion therapy ought to begin as quickly as possible, ideally within ninety minutes after the patient's initial medical contact (FMC).[4] In the treatment of acute STEMI, reperfusion is the primary and time-dependent method. In reality, the biggest problems are determining the best reperfusion method for STEMI patients and reducing the time from symptom to reperfusion. Two often utilized reperfusion techniques, primary Percutaneous Coronary Intervention (PCI) and thrombolytic therapy, are traditionally thought of as mutually exclusive alternative therapeutic modalities.[4]

For individuals with STEMI, major adverse cardiovascular events (MACE) continue to be the leading cause of death and morbidity. MACE doesn't have a precise definition. Heart failure, nonfatal re-infarction, recurrent angina pain, re-hospitalization for cardiovascular-related illness, repeat PCI, coronary artery bypass grafting, and all-cause mortality are among the multiple adverse events that have been included in various studies as a component of MACE. MACE may also involve all-cause mortality and death, stroke, re-infarction, and unplanned coronary revascularization.[7]

The objectives of this study include analysis of Tp-Te interval changes on the surface 12 lead electrocardiogram, before and after successful or failed fibrinolysis in STEMI. As well as to analyse its correlation with MACE during hospitalization and within 30 days of the index event.

2. Materials and Methods

2.1. Study population

This was a single-center, prospective observational study that included all consecutive patients with STEMI admitted between September 2020 and September 2021 who met the inclusion criteria and were receiving fibrinolysis therapy. The study was authorized by the local ethics committee (IEC application no: 491) and carried out in accordance with the Helsinki Declaration.

The inclusion criteria were as follows: 18-80 years of age group patients, patients with STEMI who underwent fibrinolysis within 12 hours of symptom onset. The exclusion criteria were as follows: patients with age > 80 years; patients having atrial fibrillation, atrial flutter, bundle branch block, preexcitation on 12 lead surface ECG; T wave < 0.1mv on surface ECG; patients having a prior history of MI; patients on permanent pacemaker implantation; patients with valvular heart disease, congenital heart disease, primary myocardial disease, electrolyte imbalance, drug intake of amiodarone, digoxin.

Informed and written consent was received from all the patients and baseline demographic data were collected at the time of recruitment. Patients were evaluated by taking history, clinical examination, 12 leads surface ECG, routine blood investigations, and 2D Echo to determine eligibility for enrolment in the study.

2.2. Electrocardiographic analysis, definitions, and study aims

In all patients, a standard 12-lead ECG machine (Cardiart 9108D, BPL, India) was recorded at 25 mm/s paper speed and 10 mm/mV gain, and 50mm/s and 20mm/mV as and when needed, respectively. The sites of infraction were selected to be anterior/inferior/lateral walls. The criteria for successful fibrinolysis were the resolution of ST elevation by 50% or more within 90 minutes of fibrinolysis. The criteria for failed thrombolysis were persistent ST elevation or resolution of ST elevation by < 50% beyond 90 minutes of fibrinolysis.

Standard ECG at the V4, V5, and V6 leads was used to quantify the Tp-Te interval. High precision has been attributed to the Tp-Te interval in the V5 lead. V4 and V6 can be used to compute the Tp-Te interval in a sequence as an alternative if V5 cannot be used for the computation.[8]

Major adverse cardiac events, such as recurrent myocardial infarction, ventricular arrhythmias (ventricular tachycardia, VF), heart failure, post-infarction angina (angina after > 24 hours but < 2 weeks after a documented MI), re-infarction (typical presentation with new ECG changes after > 24 hours but < 2 weeks after a documented

MI), sudden cardiac death, and cerebrovascular accident (CVA) were noted during hospitalization and the 30-day follow-up, either in person at the outpatient department or over the phone.

3. Results

During the study period, 165 patients were enrolled as shown in the study design (Figure 1). However, only 150 patients met the inclusion criteria and were included in the study. The following 15 patients were excluded due to the following reasons: age > 80 (n:2), atrial Fibrillation (n:2), left bundle branch block (LBBB) (n:2), qRBBB (right bundle branch block and right precordial Q-waves) (n:1), prior MI (n:4), on temporary pacemaker implantation (TPI) (n:1), ECG was not interpretable (n:3).

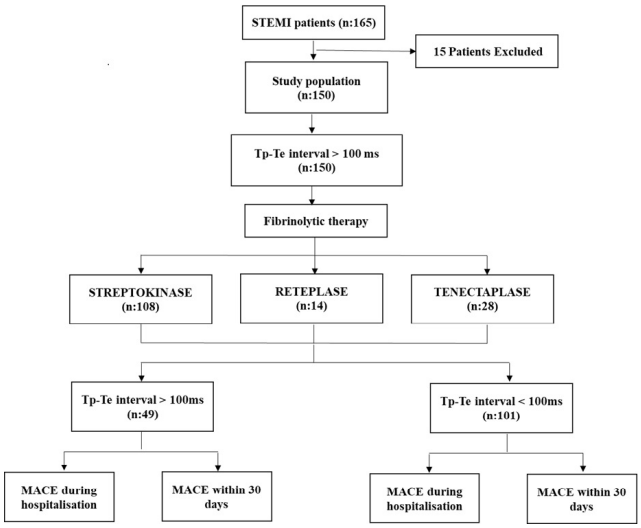

Figure 1: Study design. n = number of patients.

The study group included 150 patients, with 121 (80.7%) males and 29 (19.3%) females (Table 1).

The most common age groups that presented with STEMI were in the age group of 51–60 years (40%). It was followed by 61-70 years (26%), 18-40 years (16%), 41-50 years (15.3%), and > 70 years (2.7%) (Table 1).

The mean age was 54.21 ± 10.81 years (Table 2). Men presented at a younger age (53.83 years) compared to women (55.79 years) (Table 2). Among all patients, 85.3% of the patients presented with chest pain, and 14.7% of the patients presented with atypical symptoms (Table 1). More men presented with atypical symptoms (other than chest pain) compared to women (15.7% vs. 10.6%) (Table 1). The mean duration of symptoms on presentation was 6.14 ± 2.53 hours. Women presented earlier to the hospital compared to men i.e. 6.35 vs. 5.27 mean hours) (Table 2). Smoking was the most common risk factor in our study that caused STEMI, present in 55.4% of males. (Table 2). Other risk factors like dyslipidemia, hypertension, and diabetes mellitus were more prevalent among female than male patients, i.e. 55.2% vs. 51.2%, 62.1% vs. 41.3%, and 44.8 vs. 41.3% respectively (Table 2). When it comes to the site of MI, the anterior wall was most common (61.1%), followed by the inferior wall (38%) and lateral wall (0.7%) (Table 2). All patients received fibrinolytic therapy of which the majority received streptokinase (72%), followed by tenectaplase (18.7%) and reteplase (9.3%) (Table 1). Fibrinolysis was successful in 97 patients (64.7%), the remaining 53 patients (35.3%) had failed fibrinolysis (Table 1). All the patients underwent coronary angiography. Single vessel disease (SVD), double vessel disease (DVD), triple vessel disease (TVD), and left main coronary artery (LMCA) lesion was found in 76 (50.7%), 35 (23.3%), 30 (20%), and 9 (6%) patients respectively (Table 1). MACE occurred in 22 patients (14.7%) during hospitalization. Heart failure (12%) was most common

Table 1: Patient characteristics

Patient characteristics	Number	Percentage
Gender		
Male	121	80.7
Female	29	19.3
Age (years)		
18 to 40	24	16.0
41 to 50	23	15.3
51 to 60	60	40.0
61 to 70	39	26.0
>70	4	2.7
Chief complaint		
Chest pain	128	85.3
Atypical	22	14.7
KILLIP class		
I	93	62
II	41	27.3
II	12	8
IV	4	2.7
Site of infarction		
Anterior	92	61.3
Inferior	57	38
Lateral	1	0.7
Fibrinolytic agent		
Streptokinase	108	72.0
Reteplase	14	9.3
Tenectaplase	28	18.7
Fibrinolysis		
Successful	97	64.7
Failed	53	35.3
CAG Lesions		
SVD	76	50.7
DVD	35	23.3
TVD	30	20.0
LMCA	9	6.0

SVD: Single vessel disease, DVD: Double vessel disease, TVD: Triple vessel disease, LMCA: Left main coronary artery.

Table 2: The baseline characteristics of the study population

Variables	Male n-121 (80.7%)	Female n-29 (19.3%)	Total N-150 (100%)
Mean age (years)	53.83	55.79	54.21
Chest pain at presentation	102 (84.3%)	26 (89.7%)	128 (85.3%)
Mean duration of symptoms(hours)	6.35	5.27	6.14
Risk factors			
Hypertension	50 (41.3%)	18 (62.1%)	68 (45.3%)
Diabetes Mellitus	50 (41.3%)	13 (44.8%)	63 (42%)
Smoking	67 (55.4%)	1 (3.4%)	68 (45.3%)
Tobacco chewing	57 (47.1%)	0 (0%)	57 (38%)
Dyslipidaemia	62 (51.2%)	16(55.2%)	78 (52%)
Family History	15 (12.4%)	5 (17.2%)	20 (13.3%)
Others	0	18 (62.1%)	18 (12%)
KILLIP class			
I	74 (61.2%)	19 (65.5%)	93 (62%)
II	33 (27.3%)	8 (27.6%)	41 (27.3%)
II	10 (8.3%)	2 (6.9%)	12 (8%)
IV	4 (3.3%)	0	4 (2.7%)
Site of infarction			
Anterior	74 (61.2%)	18 (62.1%)	92 (61.3%)
Inferior	46 (38%)	11 (37.9%)	57 (38%)
Lateral	1 (0.8%)	0	1 (0.7%)

n: Number of patients

followed by arrhythmia (6.7%), post infarction angina (3.3%), re-infarction (0.7%), CVA (0.7%), and death (0.7%) (Table 3). MACE occurred in 18 patients (12%) within 30 days of the index event. Heart failure (10%) was the most common, followed by death (3.3%) and arrhythmia (2%) (Table 3).

Table 3: MACE during hospitalisation and within 30 days of the index event

MACE individual component (n:150)	MACE during hospitalisation, n (%)	MACE within 30 days of the index event, n (%)
MACE*	22 (14.7)	18 (12)
Heart failure	18 (12)	15 (10)
Arrhythmia	10 (6.7)	3 (2)
Post infarction angina	5 (3.3)	0
Death	1 (0.7)	5 (3.3)
Re-infarction	1 (0.7)	0
CVA	1 (0.7)	0

*MACE included the composite of heartfailure, arrhythmia, post infarction angina, re-infarction, death, CVA

n: Number of patients, MACE: Major adverse cardiac event, CVA: Cerebral vascular accident

Pre fibrinolysis, the mean Tp -Te interval was 111.5 ± 4.9 ms. Mean Tp-Te intervals were 110.8 ± 4.9ms and 112.3 ± 5.0 ms in the successful and failed fibrinolysis groups, respectively. Post fibrinolysis mean Tp-Te intervals were 92.5 ± 6.8 ms and 107.9 ± 7.4 ms in successful and failed fibrinolysis groups respectively. Post fibrinolysis, the mean decrement of Tp-Te interval was significant in patients with successful fibrinolysis i.e. 18.3 ± 5.8 ms, p:0.0001, whereas it was nonsignificant in patients with failed fibrinolysis i.e. 4.5 ± 6.3 ms, p:0.3 (Table 4).

A family history of coronary artery disease was seen in 13.3% of the patients (Table 2). The majority of patients presented in Killip class I (62%) followed by class II (27.3%), class III (8%), and class IV (2.7%) (Table 1). During hospitalisation, MACE occurred significantly higher in failed fibrinolysis i.e. 13.4% vs 1.3%, p:0.0001, compared to successful fibrinolysis. In patients with successful fibrinolysis during hospitalisation, mean Tp-Te interval decrement was significant in patients without MACE i.e.18.47 ± 5.66 ms vs. 10.00 ± 7.07 ms, p:0.039, compared to patients with MACE (table 5).

In patients with failed fibrinolysis during hospitalisation, mean Tp-Te interval decrement was significant in patients without MACE i.e. 6.27 ± 6.84 ms vs. 1.45 ± 3.89 ms, p:0.006, compared to patients with MACE (Table 5). Post fibrinolysis Tp-Te interval > 100 ms was significantly associated with more occurrence of heart failure i.e. 16% vs 1.3%, p:0.0001, compared to Tp-Te interval ≤ 100 ms, during hospitalisation and within 30 days of the index event (Table 6).

Table 4: Tp-Te interval following fibrinolysis

Fibrinolysis	Tp-Te interval	Pre Fibrinolysis (ms)	Post Fibrinolysis (ms)	Mean Difference (ms)	p-value
Successful	Mean	110.8	92.5	18.3	0.0001
	SD	4.9	6.8	5.8	
Failed	Mean	112.3	107.9	4.5	0.3

ms: millisecond

Table 5: Correlation of Tp-Teinterval with MACE following fibrinolysis during hospitalisation

Fibrinolysis Total (n:150)	MACE	Number (%)	Mean Tp-Te interval difference (ms)		p-value
			Mean	SD	
Successful	Yes	2 (1.3)	10.00	7.07	0.039
n:97	No	95 (63.3)	18.47	5.66	
Failed	Yes	20 (13.4)	1.45	3.89	0.006
n:53	No	33 (22)	6.27	6.84	
p-value	-	0.0001	-	-	-

MACE: Major adverse cardiac event, ms: millisecond

Table 6: Association of Tp-Te interval with heart failure

Post Fibrinolysis Tp-Te interval	Heart Failure, n (%)		Total, n (%)	p-value
	No	Yes		
≤100 ms	99 (66)	2 (1.3)	101 (67.3)	0.0001
>100 ms	25 (16.7)	24 (16)	49 (32.7)	
n:150	124 (82.7)	26 (17.3)	150 (100)	

n: number of patients

Post fibrinolysis Tp-Te interval > 100 ms was significantly associated with more occurrence of arrhythmia i.e. 7.3% vs 0.7%, p:0.0001, compared to Tp-Te interval ≤ 100 ms, during hospitalisation and within 30 days of the index event (Table 7).

Post fibrinolysis Tp-Te interval > 100 ms was significantly associated with more occurrence of death i.e. 4% vs 0%, p:0.0001, compared to Tp-Te interval ≤ 100 ms, during hospitalisation and within 30 days of the index event (Table 8).

4. Discussion

According to WHO data from 2004, the death rates from CVD for all age groups were 174.7 per 100,000 in the US, 178.8 per 100,000 in the UK, 279.5 per 100,000 in China, and 381.5 per 100,000 in India. According to data from the WHO, India is seeing a rapid "epidemiological transition" in the prevalence of CAD.[4] The CAD affects Indians 5–10 years earlier than it does other populations, and the majority of those affected are Indians that fall in the age group of 35–65-year-old productive workforce.[3] In this study, 150 patients were enrolled considering the inclusion criteria, out of which 121 were men (80.7%) and 29 were female (19.3%). The mean age was 54.2 years, which was similar to previous studies and CREATE registry where the mean age was 56.3±11.8 and 57.5±12 years, respectively.[9,10]

The mean onset of symptoms to hospital presentation was 6.1 hours which was similar to the CREATE registry i.e. 5 hours but lagged far behind the NCDR AR-G registry i.e. 1.7 hours.[11–13] This may be attributed to efficient ambulance service and awareness in developed countries whereas such a system is still in its early period of development in a rural part of our state. Females presented earlier in our study i.e. 5.2 hours to males i.e. 6.3 hours, contrary to Moser et al., 2006.[14]

In this study, dyslipidemia was observed to be the most common risk factor (52%) followed by hypertension (45.3%), smoking (45.3%), diabetes mellitus (42%), tobacco chewing (38%), and family history (13.3%). Women had a higher prevalence of diabetes mellitus, dyslipidemia, and hypertension in our study as also shown in the INTER-HEART study.[15] Males had a higher prevalence of smoking (55.4%) and tobacco chewing (47.1%) in our study population.

Typical angina on presentation was found in 85.3% of patients, whereas 14.7% had atypical presentation. The majority (62%) of the patients presented in Killip class I as shown in a previous study by Grieco et al. (78.9%).[9] Anterior wall STEMI (61.3%) was more common, followed by inferior wall STEMI, similar to observed in Kunwar et al. which was 63%.[11] In 2/3rd of the patients, streptokinase (72%) was used, followed by tenectaplase (18.7%) and reteplase (9.3%). Streptokinase was used more commonly because of its lower cost and easy availability during

Table 7: Association of Tp-Te interval with arrhythmia

Post Fibrinolysis Tp-Te interval	Arrhythmia n (%)		Total n (%)	p-value
	No	Yes		
≤100 ms	100 (66.7)	1 (0.7)	101 (100)	
>100 ms	38 (25.3)	11 (7.3)	49 (100)	0.0001
Total	138 (92)	12 (8)	150 (100)	

n: number of patients

Table 8: Association of Tp-Te interval death

Post Fibrinolysis Tp-Te interval	Mortality, n (%)		Total n (%)	p-value
	No	Yes		
≤100 ms	101 (67.3)	0	101 (100)	
>100 ms	43 (28.7)	6 (4)	49 (100)	0.0001
Total	144 (96)	6 (4)	150 (100)	

n: number of patients

emergency periods.

During angiography, 50.7%, 23.3%, 20%, and 6% of patients were found to have SVD, DVD, TVD, and LMCA lesions, respectively, of which 62.7% underwent PCI, and the rest 18.7% each advised for coronary artery bypass graft and guideline-directed medical therapy, respectively.

The mean Tp-Te interval in our investigation was 111.5 ± 4.9 ms before fibrinolysis, as reported by Dwijanarko et al. and Shentar et al.[16,17] The heart muscles' electrochemical and metabolic changes associated with acute MI impact the pH, ion channel conditions, tissue oxygen saturation, and electrochemical gradient. The duration of action potentials in the ischemia zone and ischemic border zone is complexly affected by these alterations; as a result, Tp-Te and QT intervals are prolonged. Increased disparities in repolarization duration between the normal and ischemic border zones during MI make the heterogeneity in ventricular repolarization more noticeable, which prolongs the Tp-Te interval.[18,19]

As observed in John et al. and Mahbubi et al., where Tp-Te interval decreased significantly after reperfusion therapy, either by primary PCI or successful fibrinolysis, the decrement in Tp-Te interval after fibrinolysis was significant in successful fibrinolysis, i.e. 110.8 ± 4.9 ms vs. 92.5 ± 6.8 ms, p:0.0001.[20,21] As a result, a sizable decrease in the Tp-Te interval may indicate effective fibrinolysis (Figure 2). Similar results were found in Duyuler et al. and Eslami et al., where a lower Tp-Te interval was more strongly associated with reperfusion success.[19,22]

Overall MACE occurred in 22 (14.7%) of our patients during hospitalisation. Heart failure was most common (12%), followed by arrhythmia (6.7%), post infarction angina (3.3%), re-infarction (0.7%), CVA (0.7%), and death (0.7%).

The mean decrease in the Tp-Te interval after effective fibrinolysis was shown to be significant in patients without MACE (i.e., 18.47 ± 5.66 ms vs. 10 ± 7.07 ms, p:0.039) as compared to patients with MACE. Therefore, a considerable

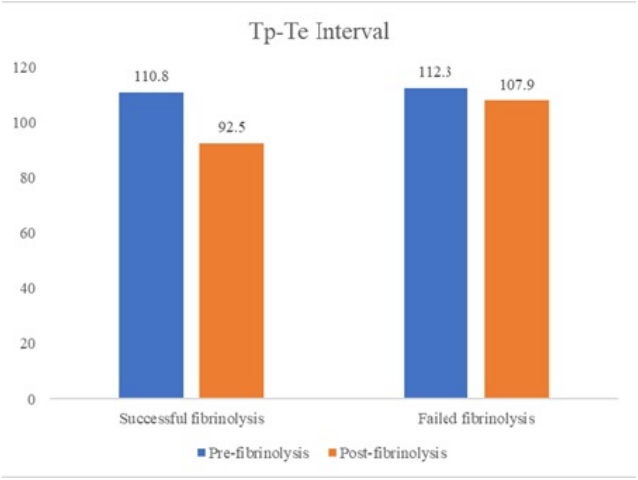

Figure 2: Tp-Te interval following fibrinolysis

decrease in the Tp-Te interval following fibrinolysis was not linked to MACE during hospitalization. This finding may be explained by the accomplishment of early patency, which has been linked to a lower incidence of arrhythmias and cardiovascular death Dey et al.[23] Simultaneously, increased incidence of MACE was linked to non-decrement of Tp-Te interval, even in fibrinolysis that was effective.

When compared to effective fibrinolysis, MACE occurred during hospitalization at a considerably greater rate in failed fibrinolysis (13.4 vs. 1.3%, p:0.0001) and was linked to a non-significant decrease in the Tp-Te interval. When fibrinolysis failed, patients without MACE had a significant mean reduction of Tp-Te interval (6.27 ± 6.84 ms vs. 1.41 ± 3.89 ms, p:0.006) when compared to patients with MACE. Simultaneously, a noteworthy reduction in the Tp-Te interval was linked to a decreased incidence of MACE, even in cases of fibrinolysis failure. Therefore, regardless of the outcome of fibrinolysis, a prolonged Tp-Te interval after fibrinolysis can be employed as a prognostic predictor

of MACE during hospitalization.

MACE occurred in 18 (12%) patients within 30 days following the index episode. Heart failure was the most common (10%), followed by death (3%) and arrhythmia (2%).

Although opinions on what constitutes a normal Tp-Te interval are divided, values of more than 100 ms are thought to be protracted in the context of myocardial infarction and are linked to an increased risk of MACE [24]. In this investigation, following fibrinolysis, patients with a Tp-Te interval greater than 100 ms had greater rates of heart failure (16% vs. 1.3%, p:0.0001), arrhythmias (7.3% vs. 0.7%, p:0.0001), and death (4% vs. 0%, p:0.0001) (Figure 3) compared to patients with a Tp-Te interval less than 100 ms, both during hospitalization and within 30 days of the index event. These findings are consistent with those of Shentar et al., Watanabe N et al., Oikarinen L et al., and Abdelrahman TM et al., which demonstrate that a Tp-Te interval greater than 100 ms increases the risk of arrhythmias and sudden cardiac death.[17,24–26] Dey et al. found that while a lower Tp-Te interval following reperfusion therapy lowers the incidence of ventricular arrhythmias while a patient is in the hospital, it had no predictive value for death or heart failure within 30 days of admission.[23] In contrast, our data shows that a decrease in the Tp-Te interval following fibrinolysis lowers the risk of MACE both during hospital stay and within 30 days following the index incident.

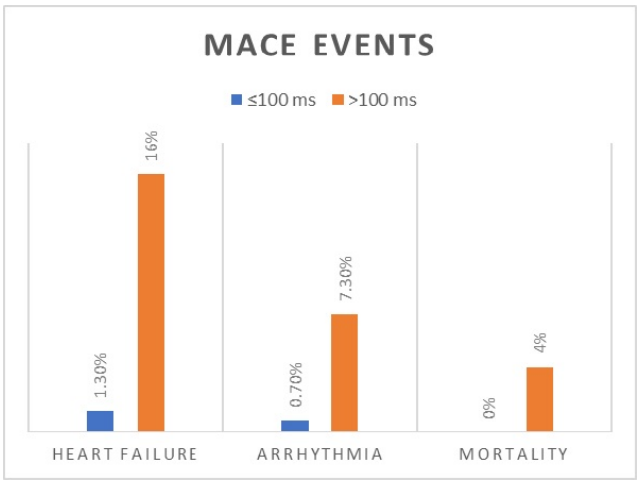

Figure 3: Association of Tp-Te interval with major MACE events

5. Conclusion

The findings from our study underscore the importance of evaluating the Tp-Te interval as a prognostic marker in STEMI patients, particularly in the context of fibrinolytic therapy. Prolongation of this interval is thought to reflect increased dispersion of repolarization across the myocardium, which may predispose the heart to arrhythmias, including ventricular tachycardia and fibrillation. The data suggest that a decrease in the Tp-Te interval following fibrinolysis is associated with a lower risk of MACE, highlighting the potential utility of Tp-Te interval monitoring as a prognostic indicator in STEMI patients undergoing fibrinolytic therapy. Overall, our study provides valuable insights into risk stratification and prognostication in STEMI patients, emphasizing the importance of monitoring the Tp-Te interval to improve clinical outcomes and guide therapeutic decisions. However, it's important to note that while Tp-Te prolongation has been associated with adverse outcomes in some studies, its clinical utility as a standalone marker for risk stratification in STEMI is still a topic of ongoing research and debate. It is typically considered alongside other clinical and electrocardiographic parameters in the assessment and management of patients with STEMI.

6. Source of Funding

None.

7. Conflict of Interest

None.

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